Measure the efficiency of the entire school, not the individual ability of the few''

Courtis Standard Research Tests
in Arithmetic

Series B

Supervisory Graph

for

SERIES B. TESTS 1-4

1913-14 Tabulations

Issued by the
Department of Cooperative Research
82 ELIOT STREET DETROIT, MICH.

"Measure the efficiency of the entire school, not the individual ability of the few"

COURTIS STANDARD RESEARCH TESTS

Series B

Supervisory Graph

EXPLANATIONS.

The character of the supervision within a school, or a school system, has a marked effect upon the uniformity of the product. With good supervision,—whether the standards be low or high,—there is steady progress from grade to grade, and where there are several classes of the same grade, whether in the same or different school buildings, these classes have closely the same class scores. This supervisory graph enables a superintendent or supervisor to draw the development curves for the four operations from the grade scores of his system, and to compare graphically the scores of various classes. It also enables a teacher to compare the results achieved in his class with those of representative classes in other cities; to see graphically the amount and character of the changes produced by his teaching. Finally, it enables a superintendent to make similar comparisons for his whole school system, and to compare school with school within his own system.

The standard scores and distributions given herein are based upon the returns from more than fifteen hundred classes from schools in nineteen states.

The theory upon which the standard scores were selected is as follows: Speed is determined largely by the neuro-muscular **machinery** of a child, and varies as the maturity, the physical or mental condition, and the incentive of the child change. Accuracy, on the other hand, is largely a matter of habit, and therefore, of training. Whatever the speed at which a child works, his results must be correct. For each grade, therefore, the nearest larger whole number of examples to the median score in examples attempted is taken as the standard speed. Standard accuracy is taken as perfection, 100%. These two ideals, median speed and perfect accuracy, are probably the best goals towards which to work, but there is nothing to prevent the adoption of other standards by those who disagree. Whatever standards may be chosen, if development curves are not regular, and if the scores of normal classes do not cluster closely around a median, the supervision is not as efficient as it might be.

Development Curves. The development curves show the development of ability from grade to grade: how much better the fifth grade can add than the fourth, etc. The data to be plotted are the class median scores in speed and accuracy as found on Record Sheet No. 1 and copied on Record Sheet No. 3. Where there are several classes of the same grade, use the median of the class scores as the grade median. Efficiencies may also be plotted, but as yet (1915) no standard efficiencies have been determined.

Standard Distributions. In the various figures, there are one hundred circles shown for each test. Each circle represents the scores of one class. The value of the scores is shown by the small figures in the rectangle in which the circle occurs. Thus: 10-8 indicates a score of ten examples attempted and eight right. No account need be taken of decimal parts of an example. The median of the class scores falls within the rectangle outlined in black. The class scores are from tests at the beginning, middle and end of the year. The standard scores are standard individual scores for the end of the term or year. (See Bulletin No. 4.)

"Measure the efficiency of the entire school, not the individual ability of the few"

COURTIS STANDARD RESEARCH TESTS

Supervisory Graph.

EXPLANATIONS, continued.

The eighth grade figure for Test 1 on page fourteen should be interpreted as follows: Out of 307 eighth grade class scores reported, one class out of a hundred made a score of sixteen examples attempted and fourteen right; two out of a hundred had a score of 7 attempted, 4 right. The median score was 11 attempted, 8 right. Other scores than those represented were also reported, but less frequently than once in one hundred times.

INSTRUCTIONS.

For Drawing Development Curves.

Plot data from School Record Sheet No. 3, vertical columns.

To draw the development curve for Speed in Addition, for instance, mark in the diagram on page four in the column **for each grade** a heavy dot horizontally opposite the score corresponding to the median speed (number of examples attempted) for that grade. Join each dot to the next by a heavy, solid line. The standard curve for speed is printed in the diagram to make comparisons easy.

Plot the curve for Accuracy in similar fashion, using a dotted line. By accuracy is meant the per cent the examples right are of the examples attempted. The standard curve for accuracy is the 100% line.

The results from several successive tests may be plotted in the same diagram by using inks of different colors for the different tests.

For Locating the Position of a Single Class.

Write the class score for any one test in the blank spaces provided under "first trial" at the proper test and grade. Then find the rectangle corresponding to these scores, and black in one of the circles in the rectangle. If there is no circle in the rectangle, draw one in, using a dotted line. This means that such a score occurs less than once in one hundred times.

SUGGESTIONS.

To show the amount and character of the changes between two tests of any one class, locate circles corresponding to the scores at each trial, then draw an arrow between them.

To compare several classes, give each a letter, as A, B, C, etc., and write these letters in the proper circles. Or use different colored inks and fill the circles.

To compare a class with scores from other cities, locate also circles corresponding to the scores of the various cities given in Bulletin No. 4, writing a letter in each circle; as D, for Detroit.

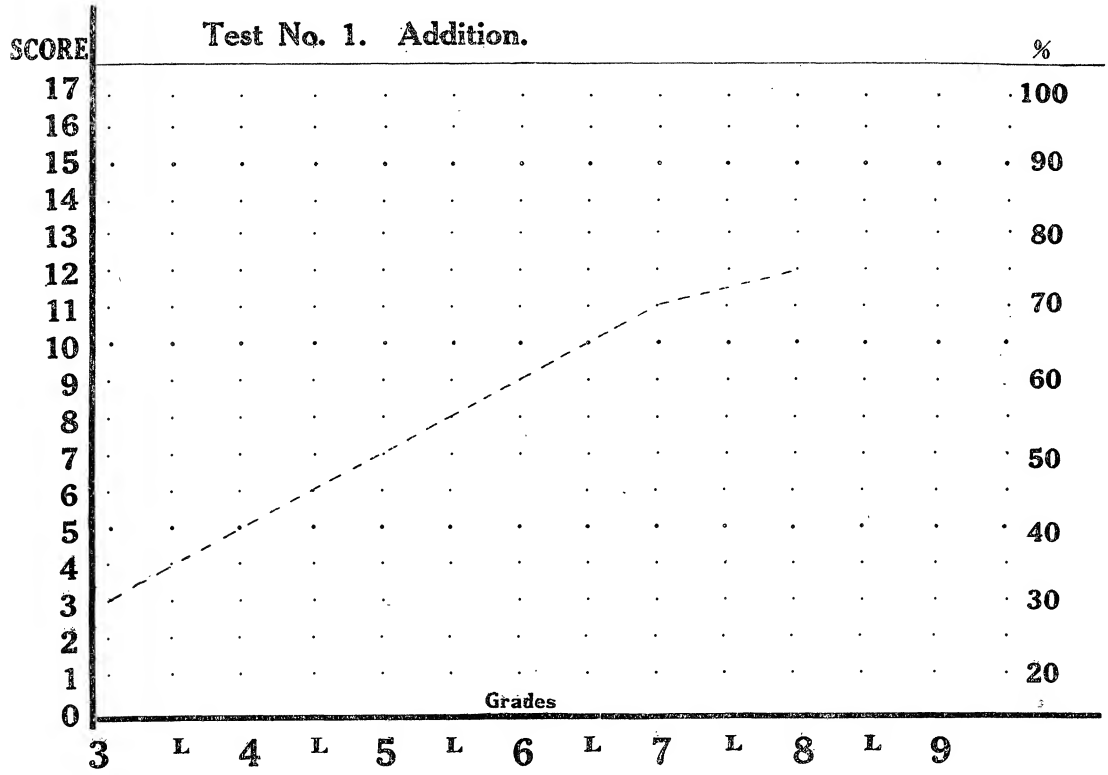
Illustrations will be found on page 16.

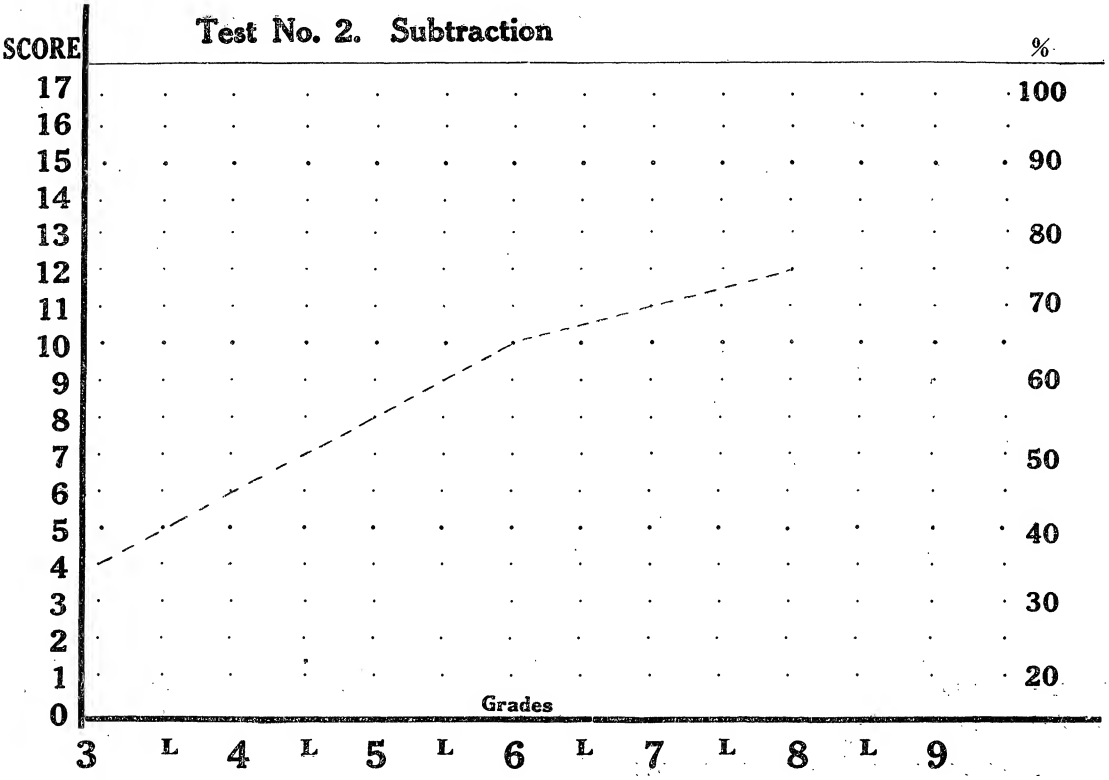
"Measure the efficiency of the entire school, not the individual ability of the few"

DEVELOPMENT CURVES IN SPEED AND ACCURACY

Class Scores (Medians) Series B.

Supervisory Graph.



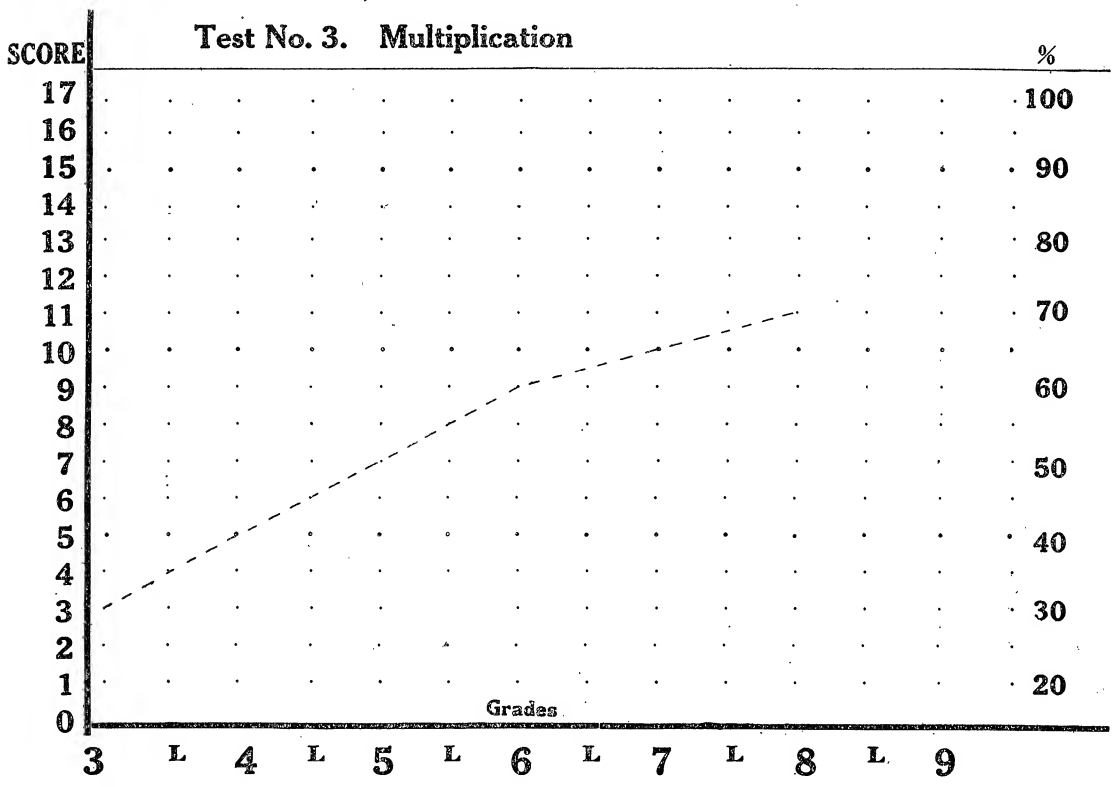


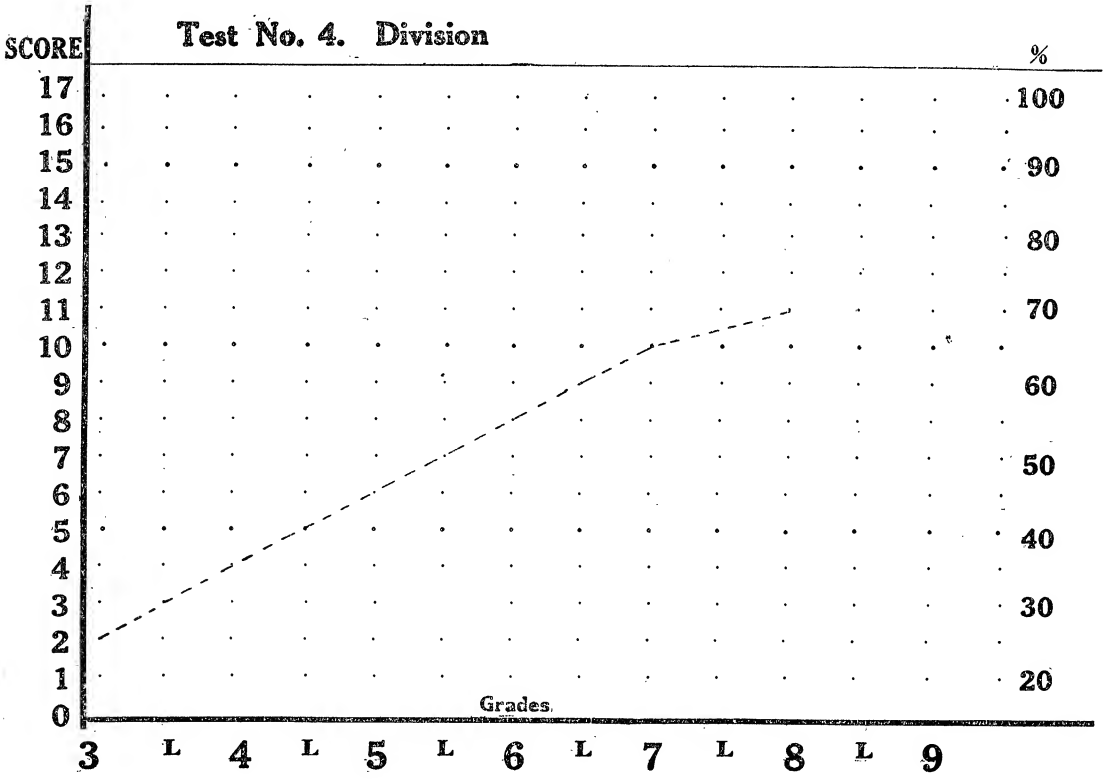
"Measure the efficiency of the entire school, not the individual ability of the few"

DEVELOPEMENT CURVES IN SPEED AND ACCURACY

Class Scores (Medians) Series B.

Supervisory Graph.





"Measure the efficiency of the entire school, not the individual ability of the few"

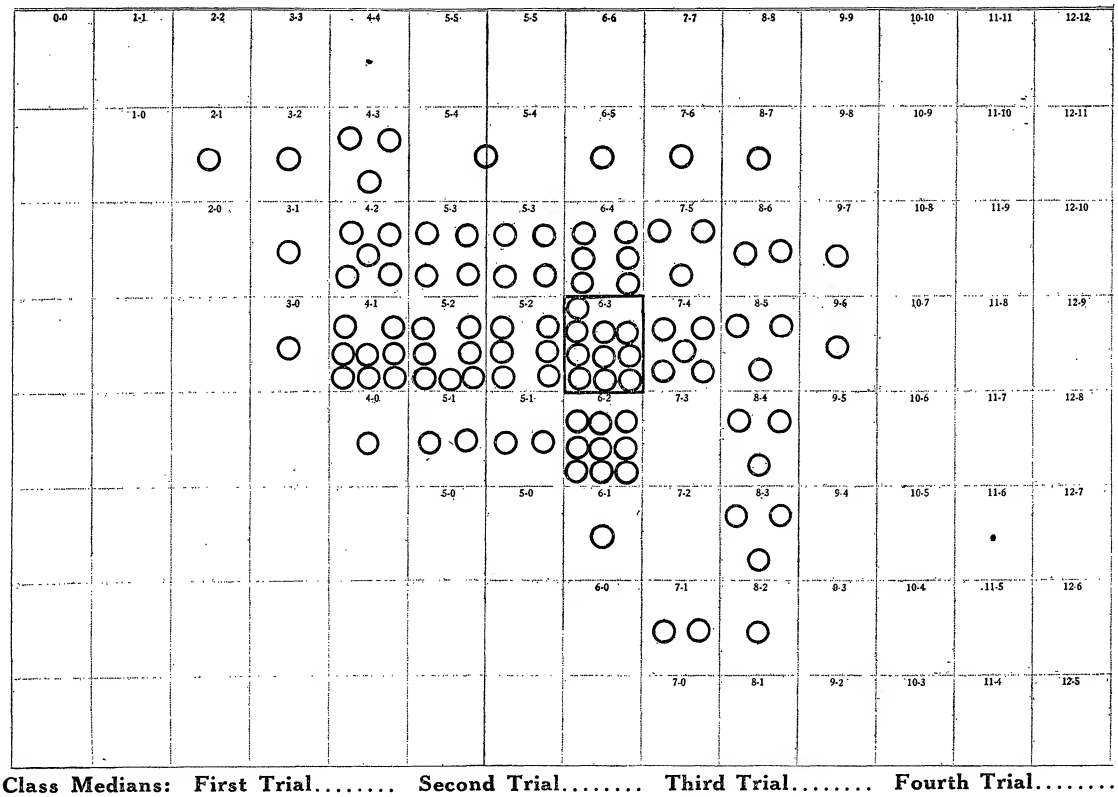
STANDARD FOURTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Based upon returns from 257 classes

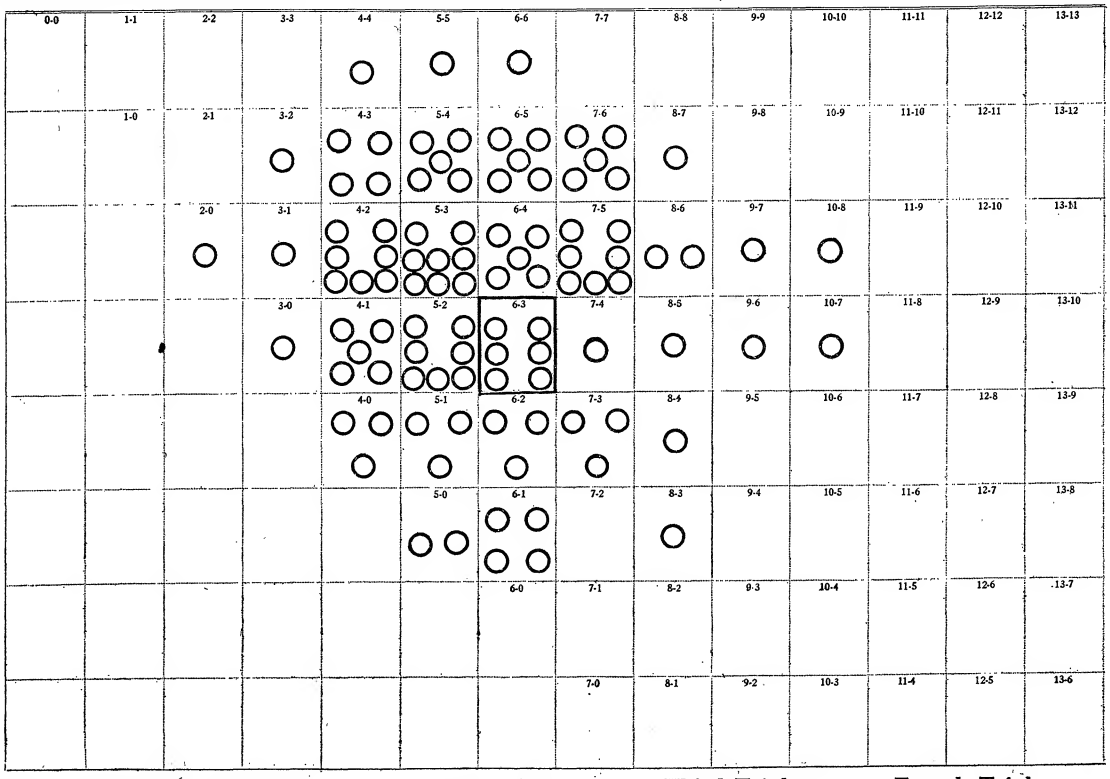
Supervisory Graph

Test No. 1. Addition Median Scores 6.1 - 3.1 (51%) **Standard Scores 5-5**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 2. Subtraction Median Scores 6.2 - 3.5 (56%) **Standard Scores 6-6**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

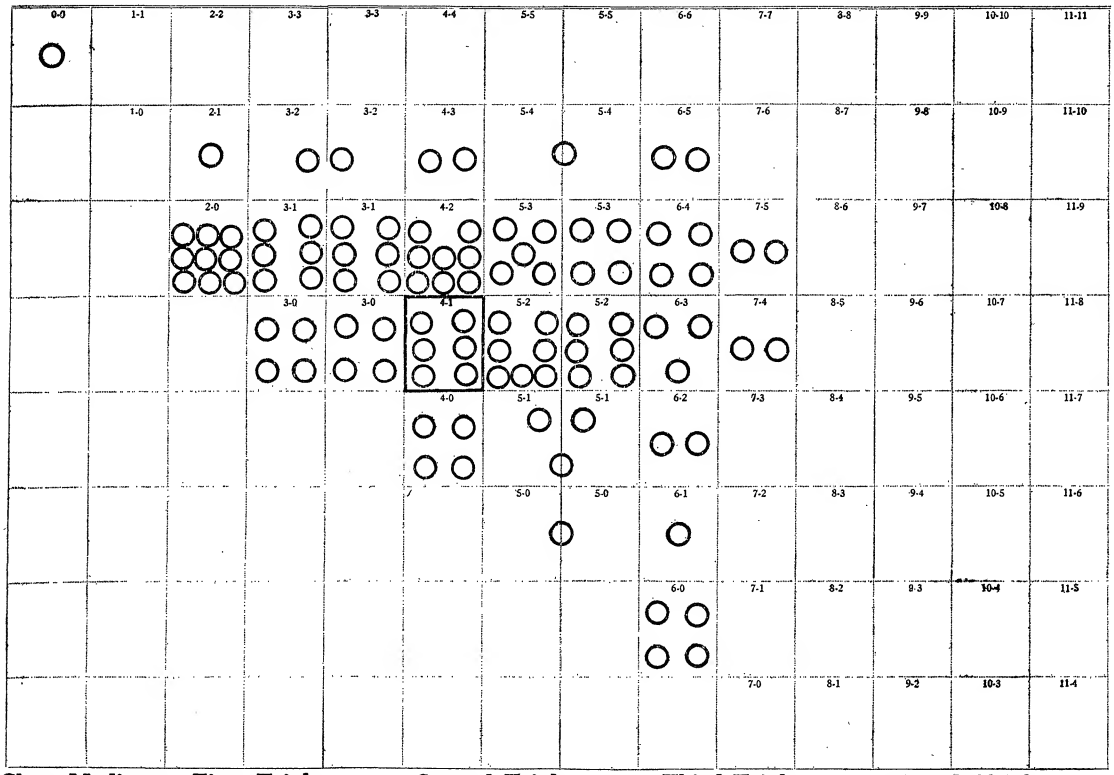
STANDARD FOURTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

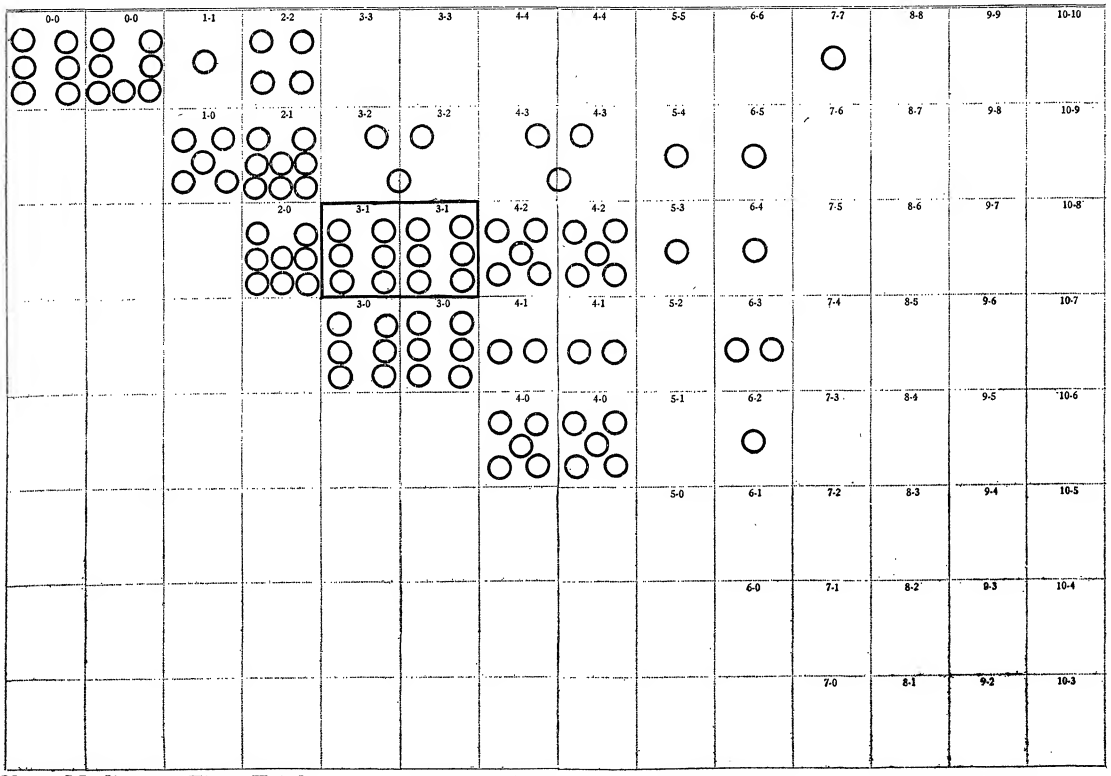
Based upon returns from 257 classes

Test No. 3. Multiplication Median Scores 4.9 - 1.9 (39%) **Standard Scores 5-5**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 4. Division Median Scores 3.4 - 1.1 (32%) **Standard Scores 4-4**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

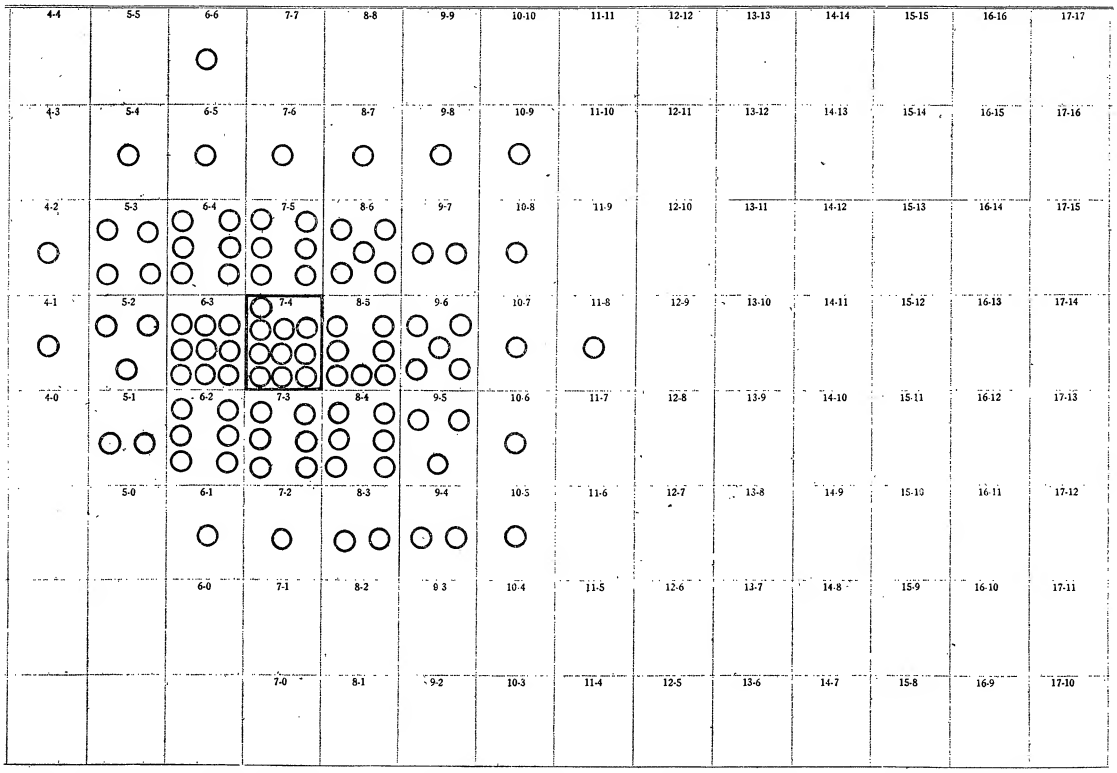
STANDARD FIFTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

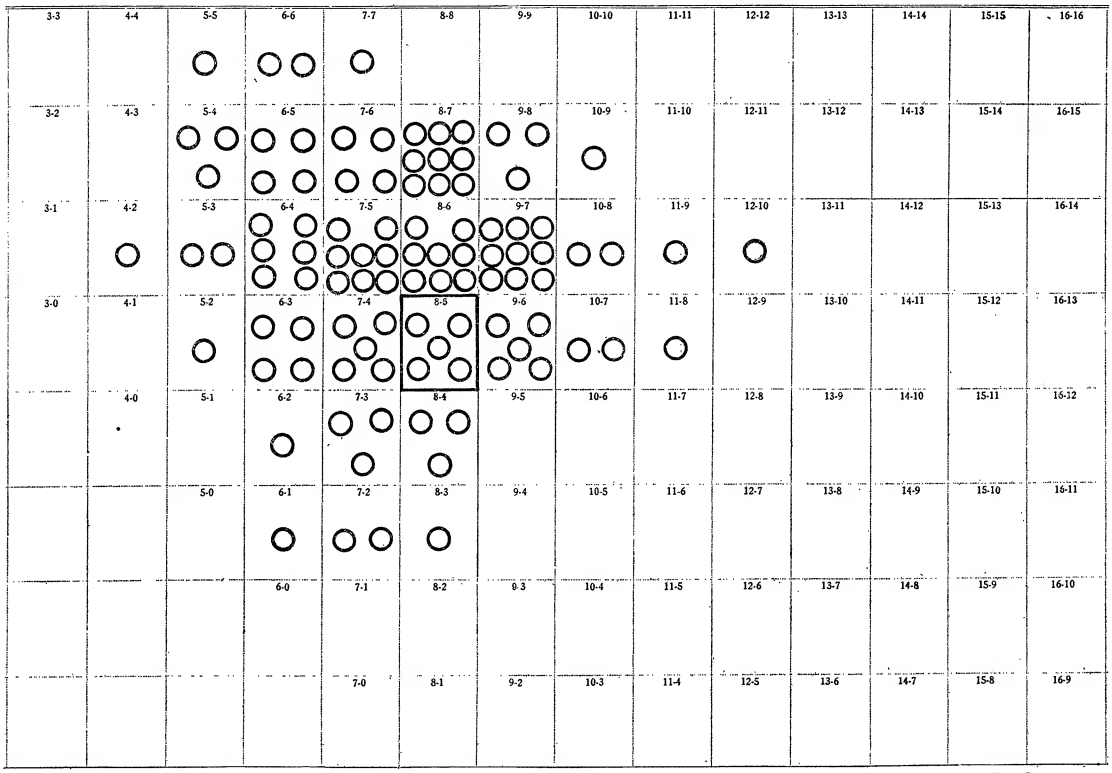
Based upon returns from 380 classes

Test No. 1. Addition Median Scores 7.6 - 4.5 (59%) **Standard Scores 7-7**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 2. Subtraction Median Scores 8.1 - 5.9 (73%) **Standard Scores 8-8**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

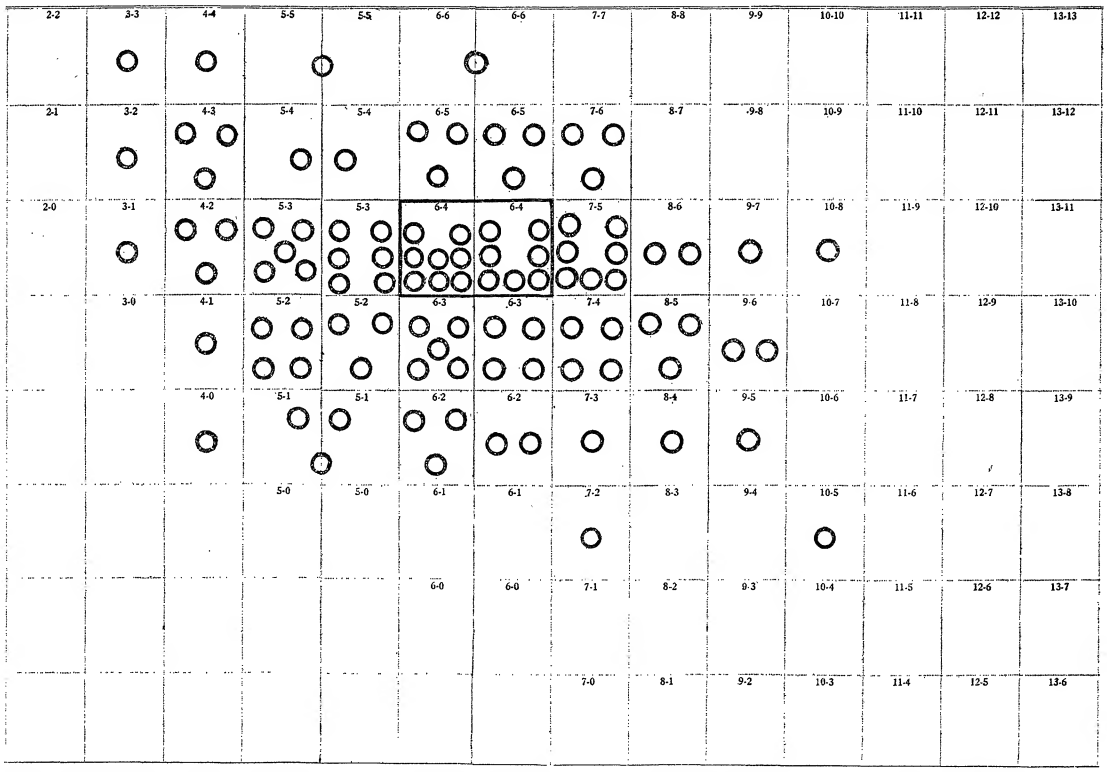
STANDARD FIFTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

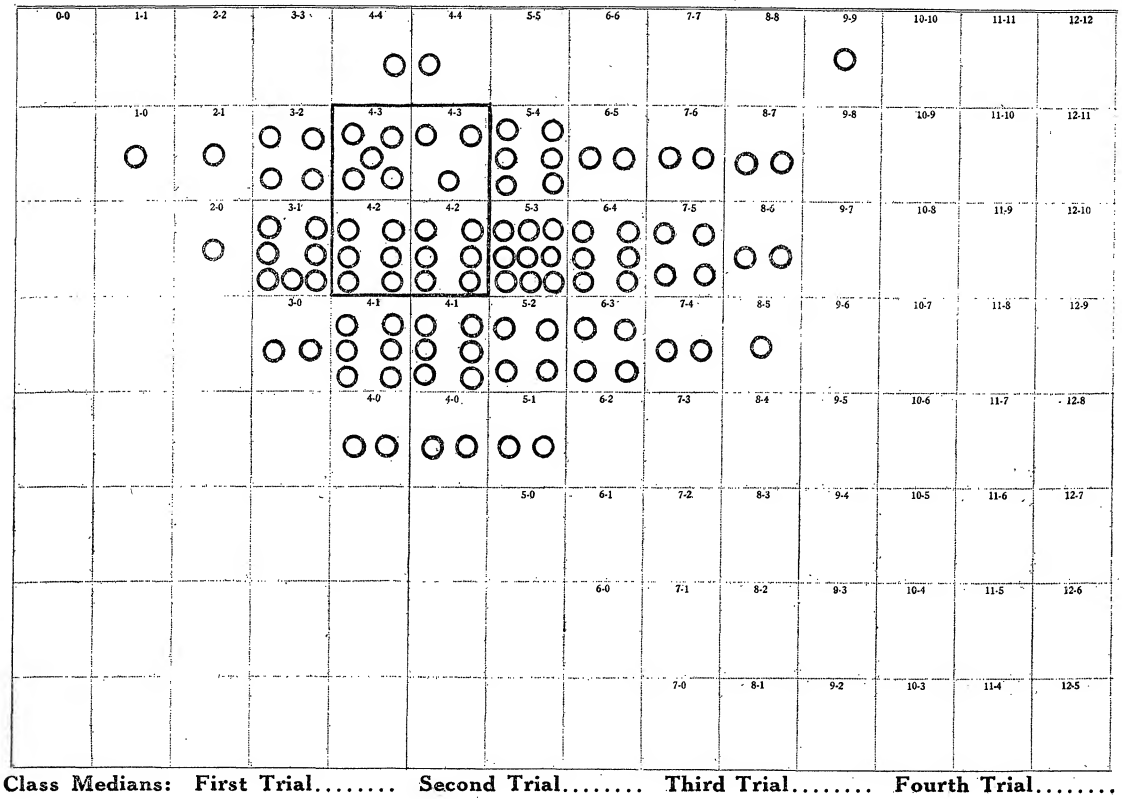
Based upon returns from 380 classes

Test No. 3. Multiplication Median Scores 6.4 - 4.0 (63%) Standard Scores 7-7



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 4. Division Median Scores 4.9 - 3.0 (61%) Standard Scores 6-6



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

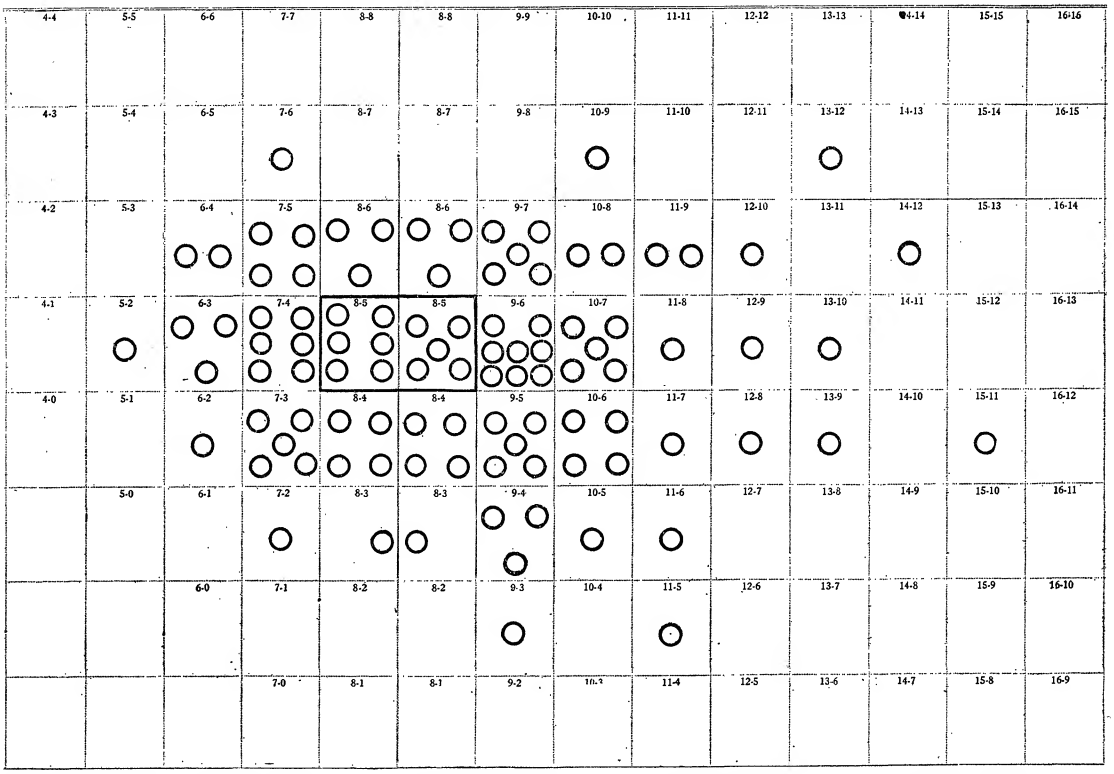
STANDARD SIXTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

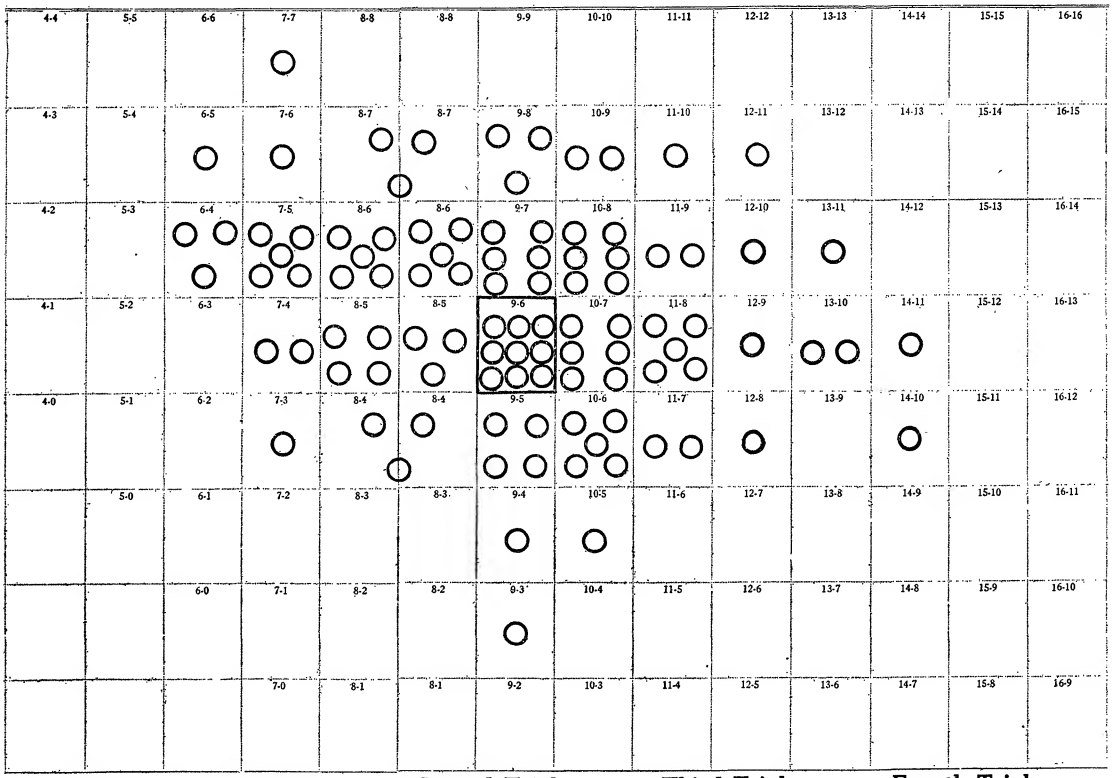
Based upon returns from 353 classes

Test No. 1. Addition Median Scores 8.9 - 5.7 (64%) **Standard Scores 9-9**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 2. Subtraction Median Scores 9.5 - 6.8 (72%) **Standard Scores 10-10**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

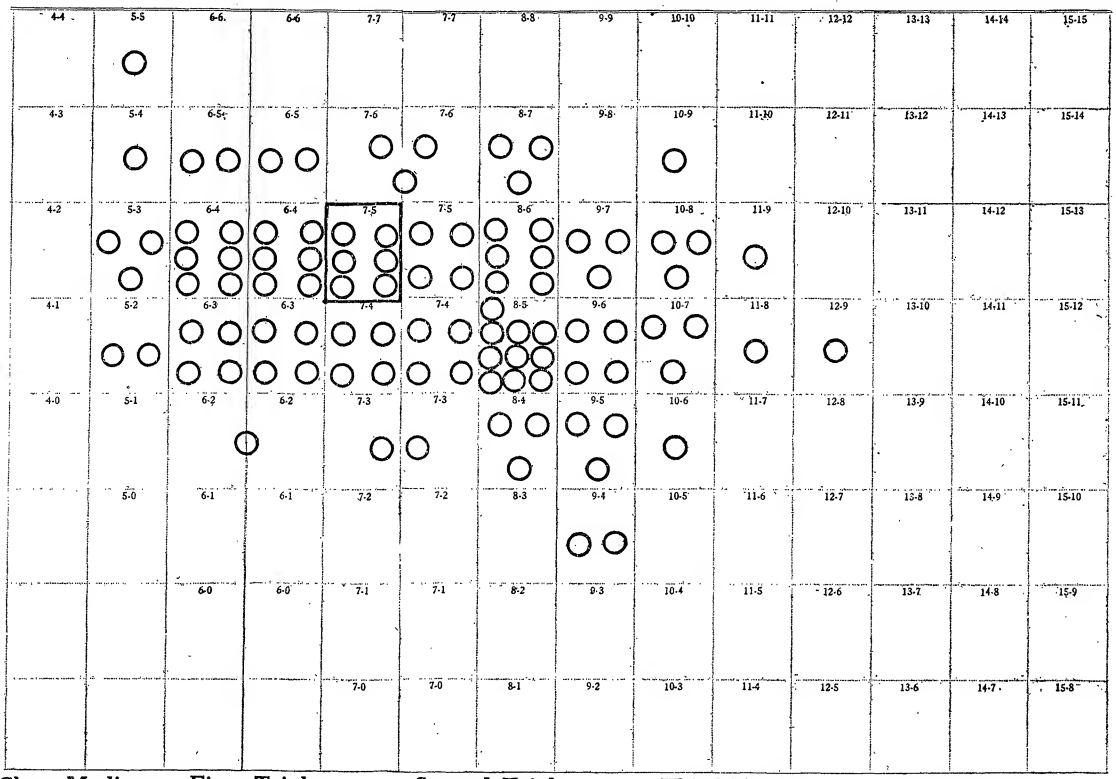
STANDARD SIXTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

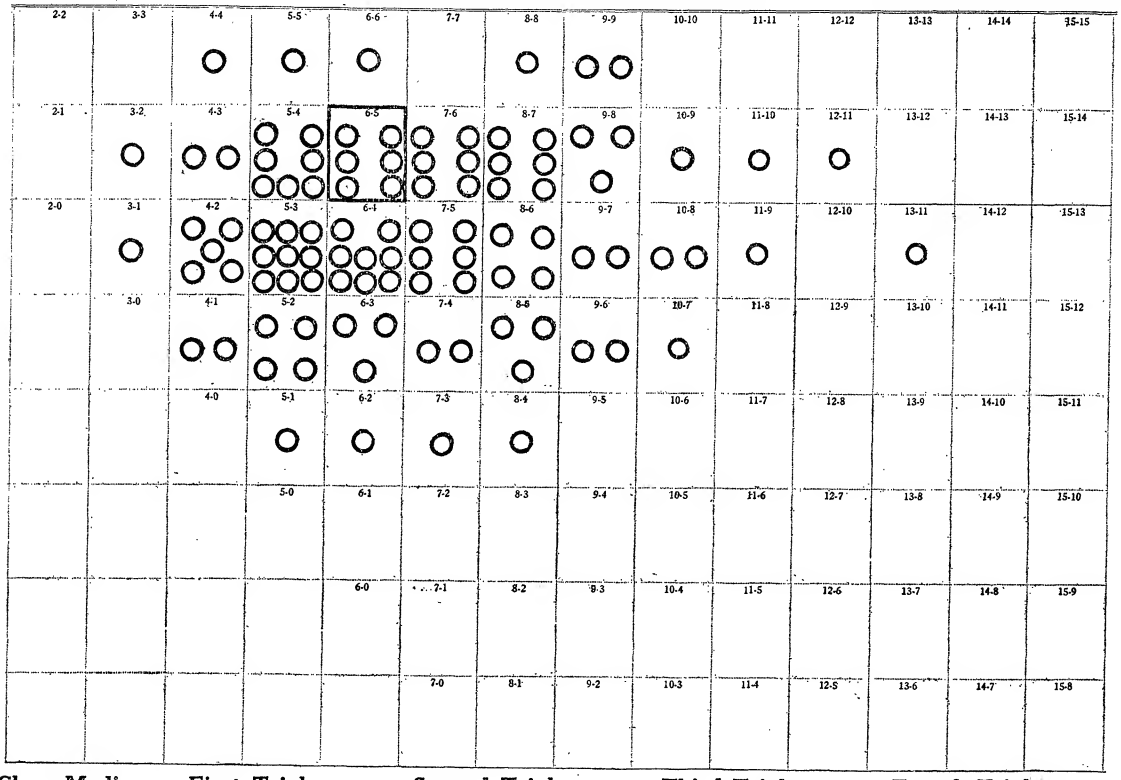
Based upon returns from 353 classes

Test No. 3. Multiplication Median Scores 7.8 - 5.3 (68%) Standard Scores 9-9



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 4. Division Median Scores 6.8 - 5.9 (87%) Standard Scores 8-8



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

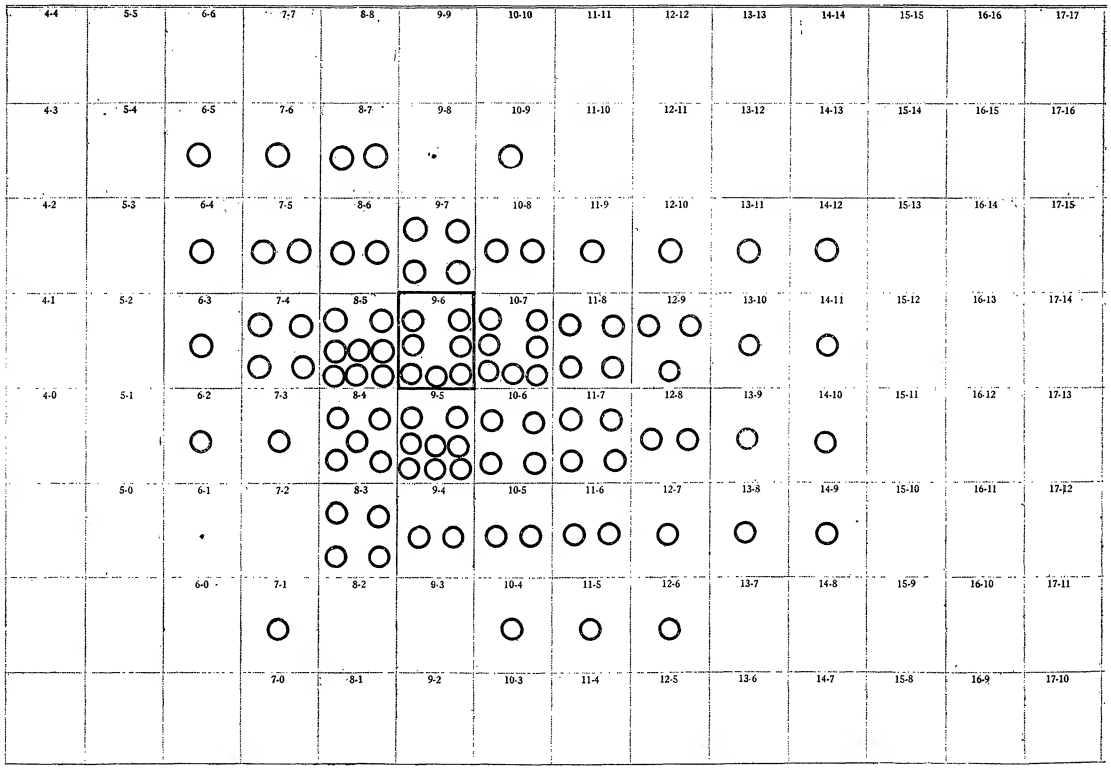
STANDARD SEVENTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

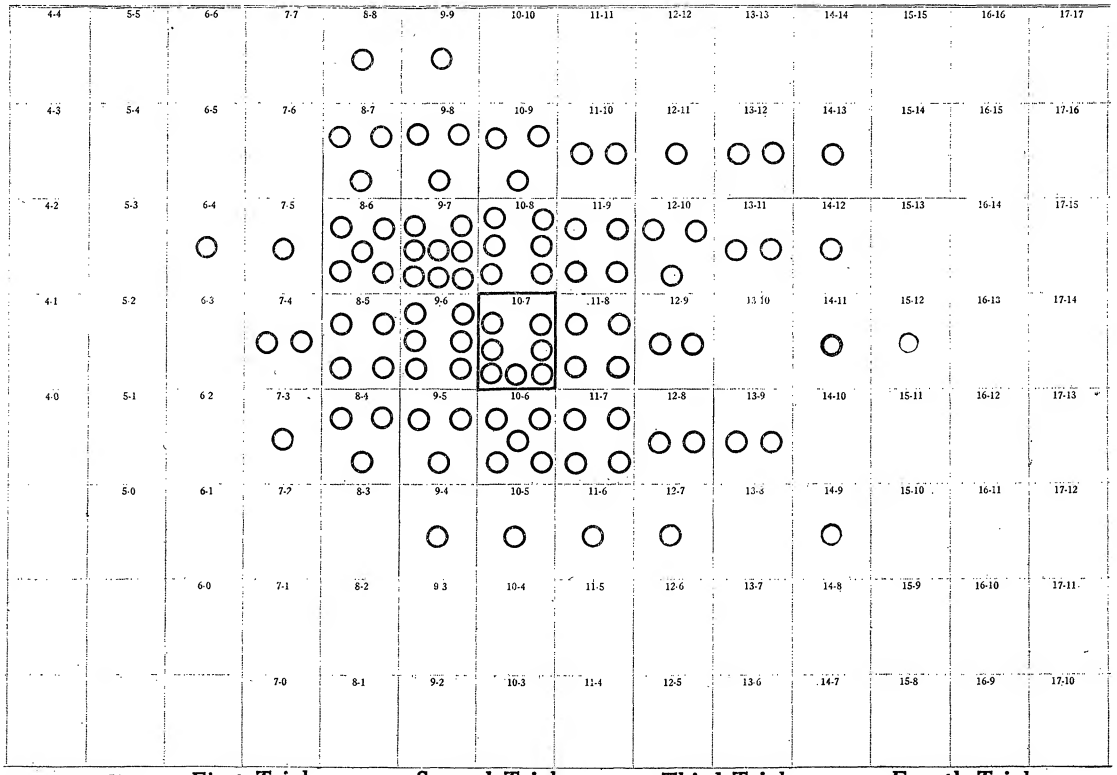
Based upon returns from 365 classes

Test No. 1. Addition — Median Scores 9.8 - 6.4 (65%) — Standard Scores 11-11



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 2. Subtraction — Median Scores 10.4 - 7.9 (76%) — Standard Scores 11-11



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

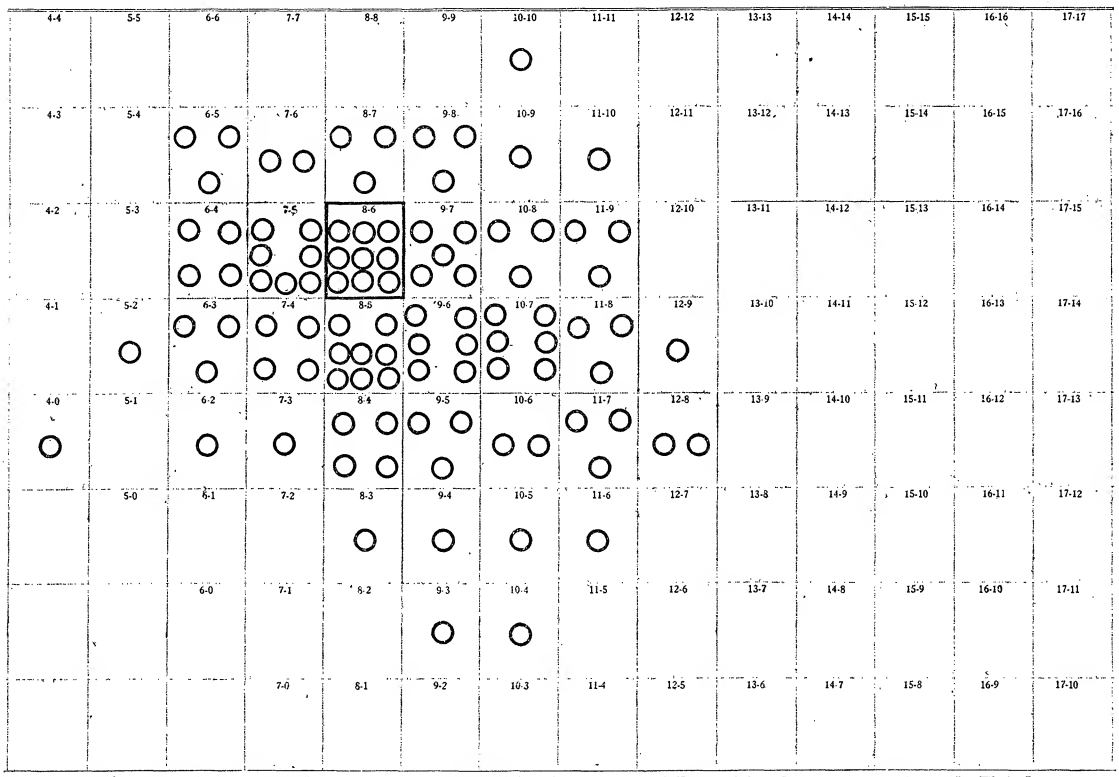
STANDARD SEVENTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

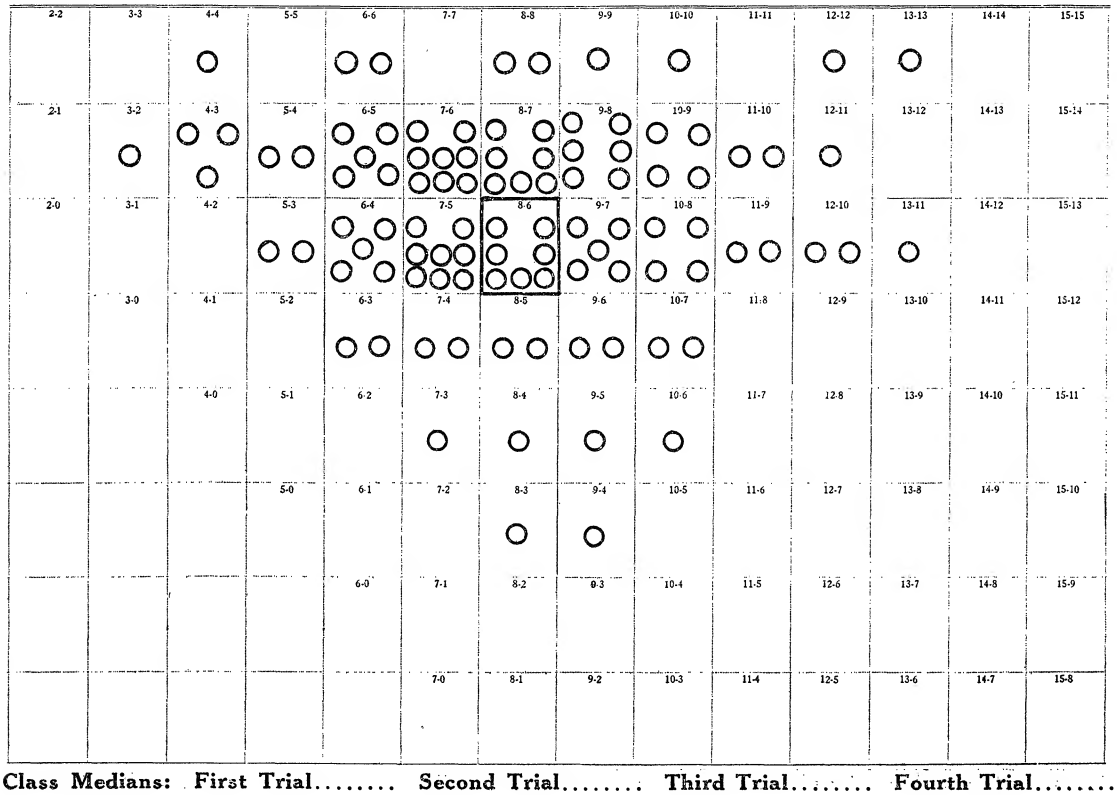
Based upon returns from 365 classes

Test No. 3. Multiplication Median Scores 8.9 - 6.2 (70%) **Standard Scores 10-10**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 4. Division Median Scores 8.4 - 6.7 (80%) **Standard Scores 10-10**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

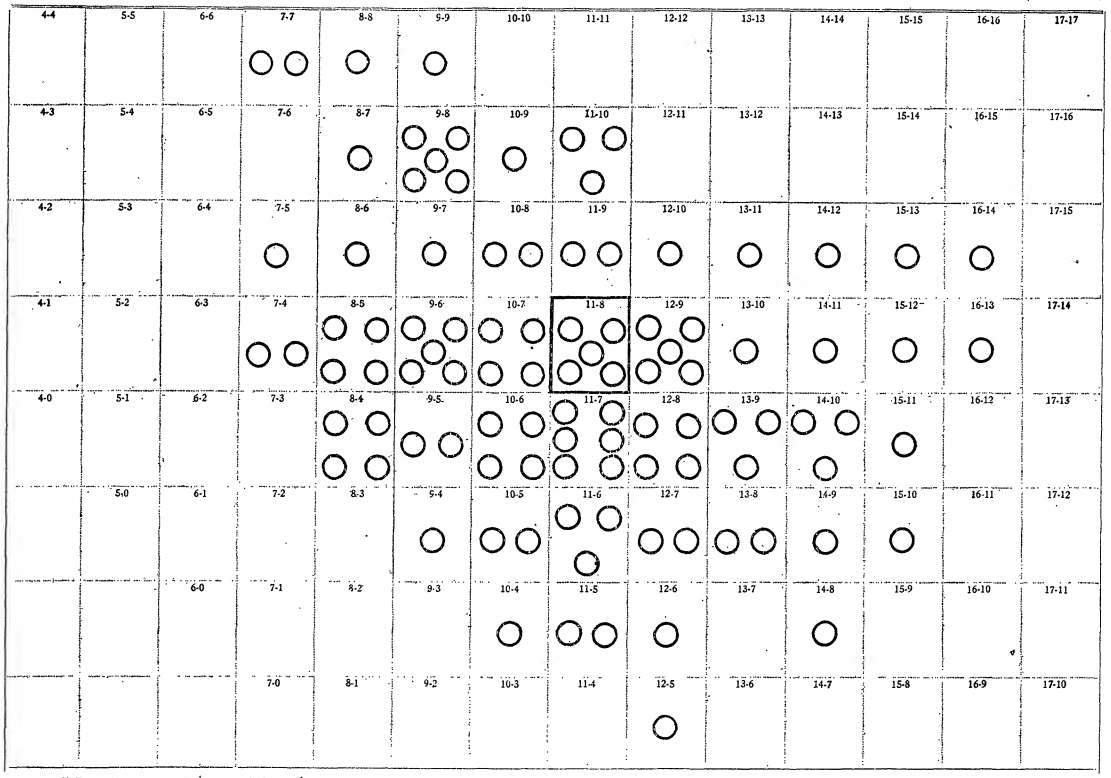
STANDARD EIGHTH GRADE DISTRIBUTIONS

Class Scores (Medians)Series B.

Supervisory Graph.

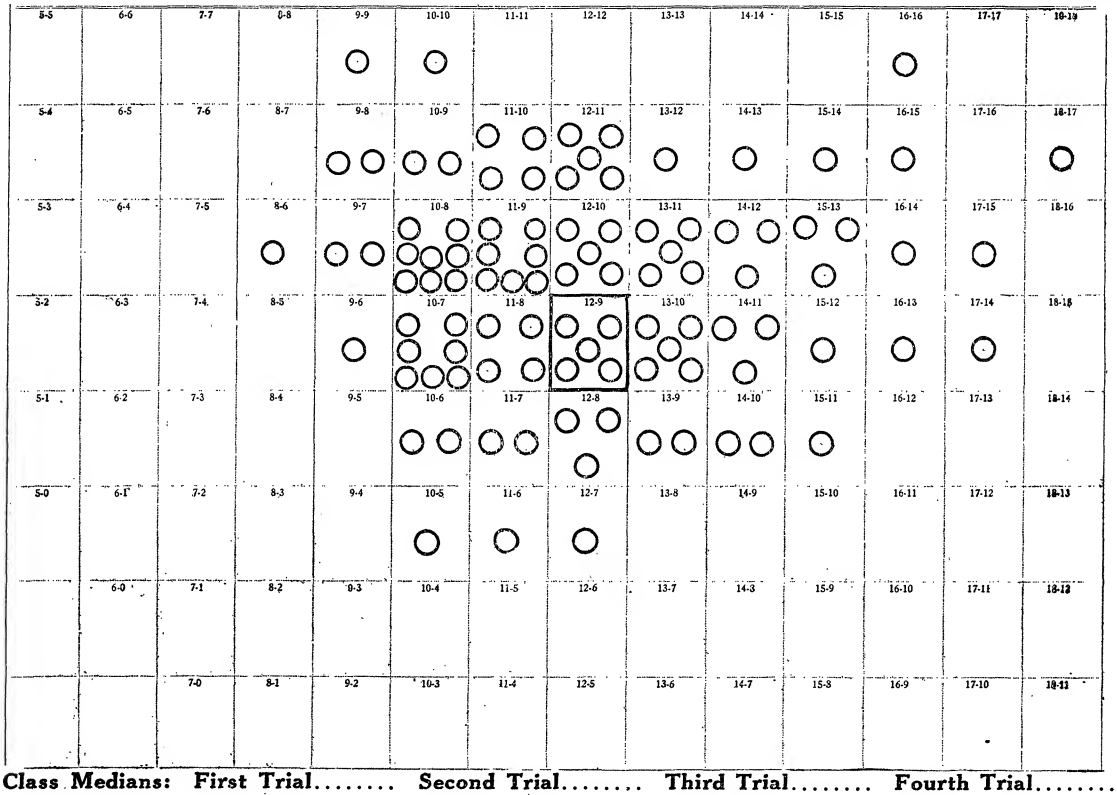
Based upon returns from 307 classes

Test No. 1. Addition Median Scores 11.2 - 8.1 (72%) **Standard Scores 12-12**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 2. Subtraction Median Scores 12.3 - 9.9 (80%) **Standard Scores 12-12**



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

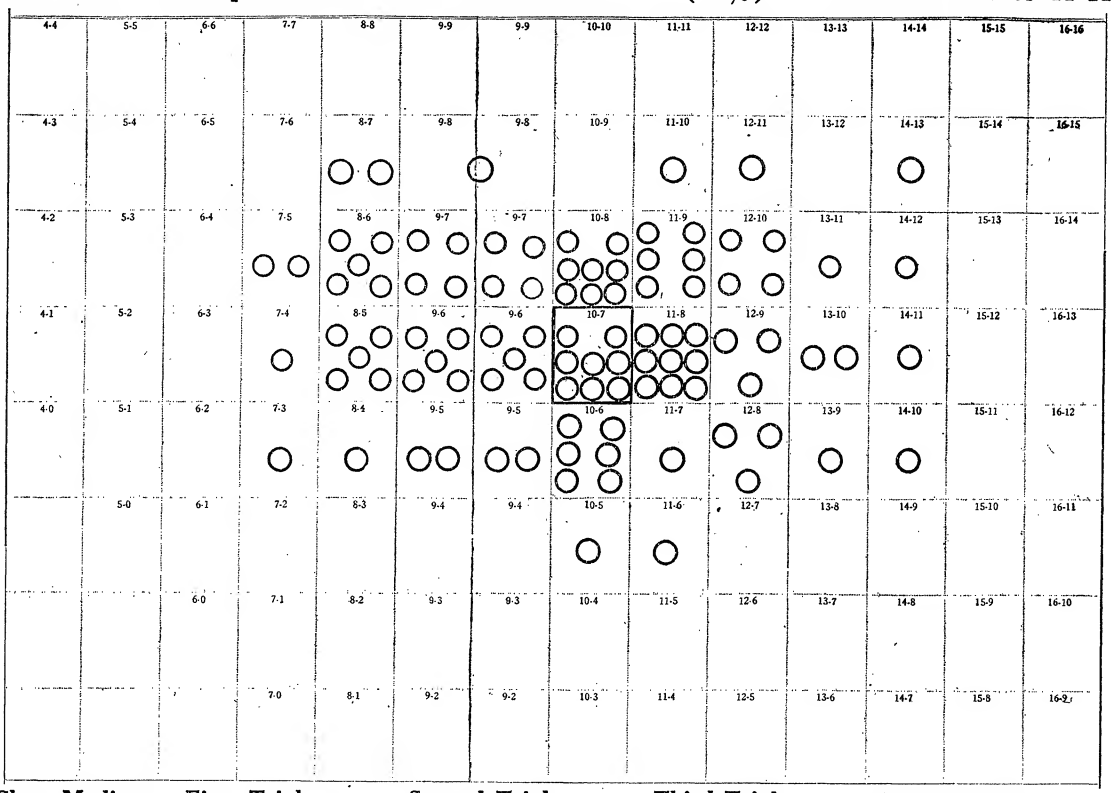
STANDARD EIGHTH GRADE DISTRIBUTIONS

Class Scores (Medians) Series B.

Supervisory Graph.

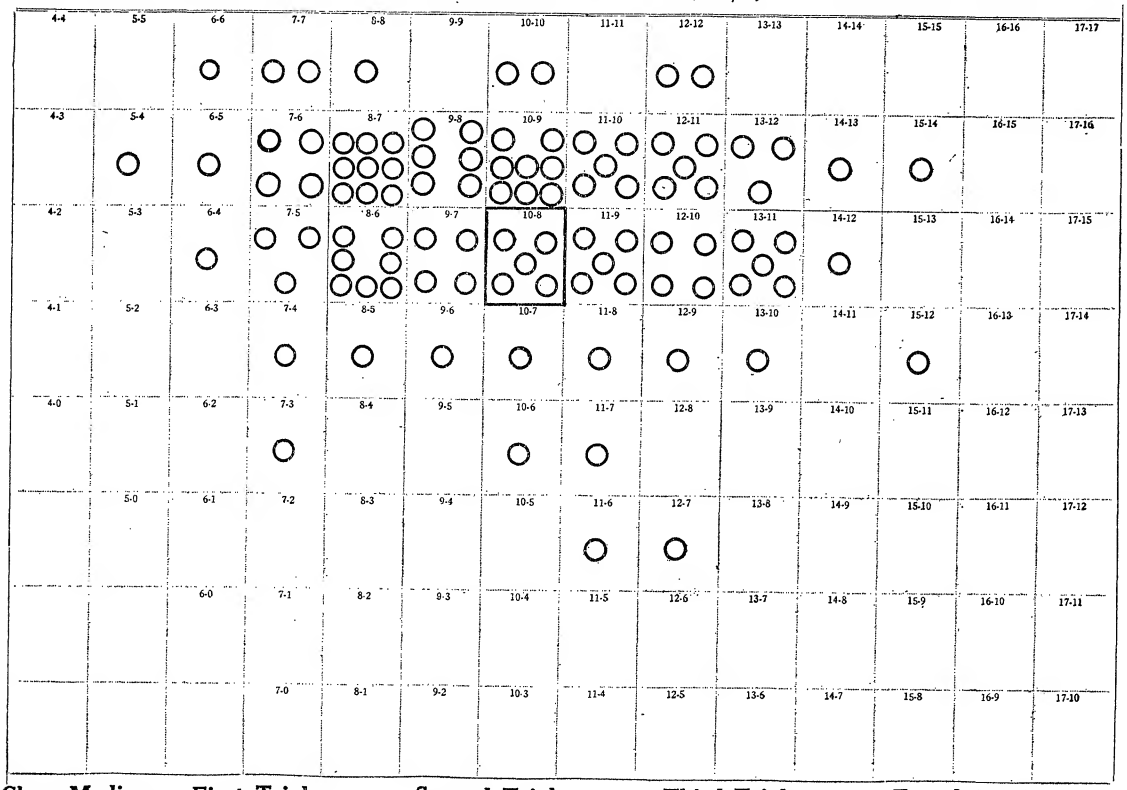
Based upon returns from 307 classes

Test No. 3. Multiplication Median Scores 10.6 - 7.6 (72%) Standard Scores 11-11



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

Test No. 4. Division Median Scores 10.4 - 8.8 (85%) Standard Scores 11-11



Class Medians: First Trial..... Second Trial..... Third Trial..... Fourth Trial.....

"Measure the efficiency of the entire school, not the individual ability of the few"

Supervisory Graph.

ILLUSTRATIONS

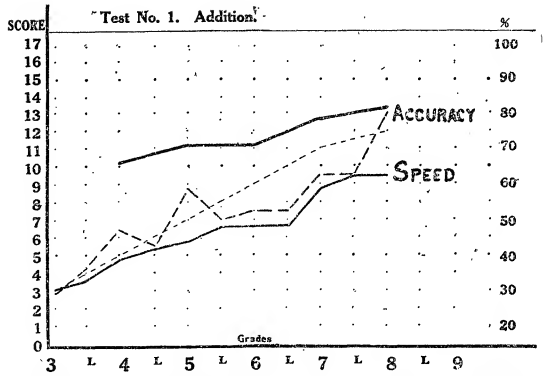


Figure 1. Development Curves for Addition from a single school, showing fair supervision and low standards. The light, solid line represents the class scores in speed, the light, broken line the scores for accuracy. The upper (heavy) solid line is the corresponding accuracy curve for the system of which the school is one unit.

The high sixth and low seventh grades are low in speed, and the high fourth, fifth, and eighth grades are relatively high in accuracy. The standards are judged low because the curves are so far below standard curves, or even the curves for the city as a whole. The cause in this case is that the school has but recently been opened.

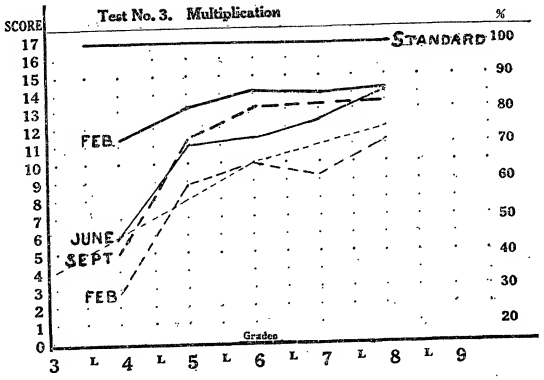


Figure 2. Accuracy curves from four successive tests in Multiplication showing progress made in one year. The test of February, 1914, is represented by the light, broken line; June, 1914, by the light, solid line; September, 1914, by the heavy, broken line, and February, 1915, by the heavy, solid line.

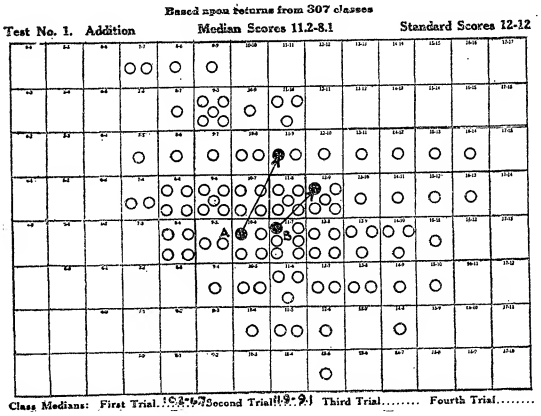


Figure 3. Comparison of six months' progress of two eighth grade classes. Actual scores: class A, first trial, 10.2 examples attempted, 6.7 examples right; second trial, 11.9-9.1; class B, 11.2-7.3 and 12.1-9.1. Note that both classes were a little below median at the first trial, class A being the lower. Note also that the lower class made the larger gain.

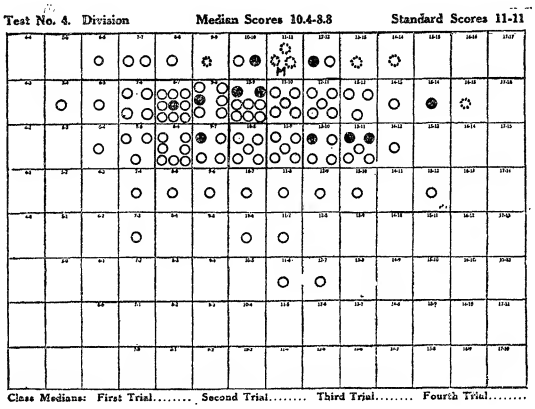


Figure 4. Comparison of eighteen eighth grade classes in one city. The results indicate poor supervision; for the scores range from eight to eighteen examples. That fourteen of the eighteen classes are above median indicates that the general standards of the city are high (the median for the city falls at M, 11-11), while the large number of 100% scores shows that the quality of the work is exceptional.